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10/525,505

02/23/2005

Onn Haran

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EXAMINER

CEHIC, KENAN

ART UNIT

PAPER NUMBER

2616

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

|                              |                                      |                                     |  |
|------------------------------|--------------------------------------|-------------------------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/525,505 | <b>Applicant(s)</b><br>HARAN ET AL. |  |
|                              | <b>Examiner</b><br>KENAN CEHIC       | <b>Art Unit</b><br>2616             |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 14 April 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-9 and 11-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) 11-14 is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Claim Objections***

1. Claim 1-9 are objected to because of the following informalities: Claim 1 does not end with a period. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

2. Claims 1, 4-8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kramer et al. (US 6,546,014) in view of Patrick (US 2005/0175014).

For claim 1, Kramer discloses in a passive optical network (PON) (see fig 2; 202 and col 2 lines 20-40 "PON") a method for transmitting packets (see col 5 lines 1-14 "frames...IP packets" and fig. 8 ONU-1 through ONU-3 TX) by an optical network unit (ONU) (see fig 2; ONU-1 through ONU-3) comprising the steps of:

receiving a grant (see fig 12; 1206, 1208 and col 6 line 66 through col 7 lines 20 "GRANT message....received by the ONU-1....receiving the GRANT message...") having a grant length ( see col 6 lines 66 through col 7 lines 20 "1200 bytes" and col 7 lines 35-45 "OLT has authorized the ONU-1 to send a specific number of bytes by the GRANT message") from an optical line terminal (OLT) (see fig 2; 204 and col 6 line 66 through col 7 lines 20 "OLT...transmits an ONU control message....message...referred to herein as a GRANT message" ) of the PON (see fig 2; 202 and col 2 lines 20-40 "PON"); and the optical network unit (ONU) (see fig 2; ONU-1 through ONU-3).

For claim 4, Kramer discloses stage variable is selected from the group consisting of reported bytes below threshold (see col 8 lines 15-35 "variable lengths, may not exactly fill the granted window size" and col 8 line 64-25 "grant size...is zero bytes...entry ....is zero....grant message is zero") , and wherein said performing of a stage test (see col 8 lines 15-35 "variable lengths, may not exactly fill the granted window size" and col 8 line 64-25 "grant size...is zero bytes...entry ....is zero....grant message is zero") involving a

stage variable (see col 8 lines 15-35 “variable lengths, may not exactly fill the granted window size” and col 8 line 64-25 “grant size...is zero bytes...entry ....is zero....grant message is zero”) includes comparing a value of said stage variable to zero (see col 8 lines 15-35 “variable lengths, may not exactly fill the granted window size” and col 8 line 64-25 “grant size...is zero bytes...entry ....is zero....grant message is zero”; comparing if difference between variable lengths and granted window size is zero ).

For claim 5, Kramer discloses said ungranted packet is marked as granted (see col 12-25 “number of bytes...when the REQUEST message was sent,is used by the OLT to update the polling table.... $4300-1200=3100$ ”), if the result of said comparison (see col 8 lines 15-35 “variable lengths, may not exactly fill the granted window size”) is that said value of said stage variable (see col 8 lines 15-35 “variable lengths, may not exactly fill the granted window size”) is greater than zero (see col 8 lines 15-35 “variable lengths, may not exactly fill the granted window size”).

For claim 6, Kramer discloses grant is a flexible grant set by said OLT (see col 8 line 64-15 “entry is zero...request ...congaing the last number of bytes waiting in the buffer....grant message is zero bytes” and col 6 line 55- col 7 line 15 “authorizes...to send 1200 bytes....” and fig 8 ; OLT TX....1200 1.....400 2.....2500 3; grants sent by OLT) based on information received from the ONU (see col 8 line 64-15 “entry is zero...request ...congaing the last number of bytes waiting in the buffer....grant message is zero bytes” and col 6 line 55- col 7 line 45“authorizes...to send 1200 bytes....REQUEST message” and col 2 lines 40-57 “request message...updated information about the current ize of the data...updating the table...Each grant message is

indicative....amount....dependent on the information included...in the table” and fig 8 ;

OLT TX....1200 1.....400 2....2500 3; grants sent by OLT).

For claim 7, Kramer discloses information includes a combination of values of bytes below threshold (see col 8 lines 22-45 "granted window is not fully filled by the data from an ONU.... send less data, leaving the remaining amount....results in underestimated value...bytes received") and total bytes (see col 8 lines 22-45 "bytes received").

For claim 8, said threshold (see col 8 lines 22-45 "granted window is not fully filled by the data from an ONU.... send less data, leaving the remaining amount....results in underestimated value...bytes received") is adaptive (fig 8 ; OLT TX....1200 1.....400 2....2500 3; and col 7 lines 1-15 "size of granted window" grants sent by OLT).

Kramer is silent about:

For claim 1, based on said grant, calculating an packet egress order that eliminates packet fragmentation.

Patrick from the same or similar field of endeavor discloses a communication system with the following features:

For claim 1, based on said grant (see section 0012 "class's assigned bandwidth" and section 0015 "classes bandwidth"), calculating an packet egress order that eliminates packet fragmentation (see section 0029 "transmission of packets onto a data transmission link....scheduler...enques the packets and reorders the packets if necessary...predetermined criteria", section 0043 "scheduling priority...serviced in

priority order, subject to bandwidth limits” , section 0053 "each class in order of priority” and section 0028 “transmitted”) .

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Kramer by using the features, as taught by Patrick, in order to provide a simple and effective algorithm ( hierarchical prioritized round robin scheduling) for handling overbooked classes. (see Patrick sections 0005-16).

3. Claim 2, 3, 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kramer et al. (US 6,546,014) and Patrick (US 2005/0175014), further in view of Shi et al. (US 2003/0179769).

For claim 2, Kramer and Patrick disclose the claimed invention as described in paragraph 2.

For claim 2, Kramer further discloses step of calculating (see col 8 lines 21-39 “send the higher-priority data packets before the other buffered data....fragmentation is not available....send less data, leaving the remaining amount of data in the buffer”) is preceded by a step of handling out of band information (see col 8 lines 10-40 “updated entry for the ONU-1 can be computed as follows:...updated entry.....situations when the granted window size is not fully filled by the data from an ONU”);

For claim 3, Kramer further discloses checking (see col 8 lines 10-40 “updated\_entry...high priority packet....leaving remaining amount of data in the buffer....updated\_entry”) said buffer (see fig 2; 212) for ungranted packets (see col 8 lines 10-40 “updated\_entry...high priority packet....leaving

remaining amount of data in the buffer....updated\_entry”), and wherein said step of calculating (see col 8 lines 10-39 “send the higher-priority data packets before the other buffered data....fragmentation is not available....send less data, leaving the remaining amount of data in the buffer”) includes performing a three stage test (see col 8 lines 10-39 “higher-priority....variable lengths, may not exactly fill the granted window size.....If packet fragmentation is not available” and col 8 line 64-25 “grant size...is zero bytes...entry ....is zero....grant message is zero”) on each of said ungranted packets (see col 8 lines 10-40 “updated\_entry...high priority packet....leaving remaining amount of data i nthe buffer....updated\_entry”), each of said stage tests involving a stage variable test (see col 8 lines 10-39 “higher-priority....may not exactly fill the granted window size.....If packet fragmentation is not available” and col 8 line 64-25 “grant size...is zero bytes...entry ....is zero....grant message is zero”).

For claim 9, Kramer discloses said values of bytes below threshold (see col 8 lines 22-45 "granted window is not fully filled by the data from an ONU.... send less data, leaving the remaining amount....results in underestimated value...bytes received") and total bytes (see col 8 lines 22-45 “bytes received”).

Kramer is silent about:

For claim 2, includes handling a sub-queue of a given priority.

For claim 3, sub-queue.

For claim 9, accumulated from highest to lowest priority.

Shi from the same or similar field of endeavor discloses a communication network with the following features:



For claim 2, Shi discloses includes handling a sub-queue (see fig 21 “queues” and section 0145 “queues”) of a given priority (see section 0125 “Weighted Round Robin” and fig 21 “WRR”).

For claim 3, Shi discloses a sub-queue (see fig 21 “queues” and section 0145 “queues”).

For claim 9, Shi discloses accumulated from highest to lowest priority (see section 0088-0089 “bigger weight....weight giving to each ONU” and section 00125 “Weighted Round Robin....scheduler....schedule the queues”).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Kramer and Patrick by using the features, as taught by Shi, in order to eliminate having an ONU wait for the duration of multiple frames after a transmission and before it can transmit again, thereby to eliminate the related delay variation and/or jitter, which has benefits in voice quality delivery (see section 0019-0022).

***Allowable Subject Matter***

4. Claim 11-14 are allowed.

For claim 11, the prior art fails to disclose by either anticipation or combination “matching said total byte length with said grant length, wherein said step of matching includes, by each said ONU, hiding from said OLT an update in a queue status, whereby the fragmentation loss is eliminated”. The closest prior art Kramer et al. (US 6,546,014) discloses matching grant length to a total byte length, however does not using hiding an update of the queue status.

*Conclusion*

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

|                    |         |                    |            |
|--------------------|---------|--------------------|------------|
| US-6,229,788 B1    | 05-2001 | Graves et al.      | 370/230    |
| US-6,519,255 B1    | 02-2003 | Graves, Alan F.    | 370/392    |
| US-2003/0137975 A1 | 07-2003 | Song et al.        | 370/353    |
| US-6,636,527 B1    | 10-2003 | Lee et al.         | 370/465    |
| US-6,735,211 B1    | 05-2004 | Karasawa, Satoru   | 370/412    |
| US-6,804,256 B2    | 10-2004 | Chang, Tsung-Shien | 370/468    |
| US-7,263,101 B2    | 08-2007 | Kim et al.         | 370/395.64 |

The above are recited to show system of queuing and priority associated with PON networks.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to KENAN CEHIC whose telephone number is (571)270-3120. The examiner can normally be reached on Monday through Friday 8:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kwang Yao can be reached on (571) 272-3182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2616

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KC

/Kwang B. Yao/

Supervisory Patent Examiner, Art Unit 2616